



## Safety & Mission Assurance

Presenter **M. D. Erminger**

Date **November 15, 2001**

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# STS-108/UF1

## Flight Readiness Review



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# Approach and General Description

**S&MA held reviews in preparation for the STS-108/UF1 Flight Readiness Review on 29 October and 13 November 2001 and is ready to proceed toward launch countdown.**

## FRR Briefing Overview

- **Significant assessments - *discuss***
- **Special topics**
  - **NASA Safety Reporting System (NSRS) - *discuss***
  - **Space Shuttle Hazard Analysis - *discuss***
  - **Space Shuttle FMEA/CIL – *discuss***
- **Space Shuttle and Space Station Independent Assessments - *discuss***
- **Significant Open Work - *discuss***
  - *CoFR Exceptions - none*
  - *Open Action Items - none*



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# Significant Assessments

## Space Station

- Solar Array Power on during EVA

## Orbiter

- OV-105 OMS Pod Attach Point 5
- Orbiter Wheel Corrosion    *\* Significant Open Work – Flight Constraint*

## EVA

- EMU Display and Control Module Electrical Failure

***ADDITIONAL ASSESSED ITEMS ARE IN THE BACKUP CHARTS***



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# Significant Assessments

## SSME

- STS-104 Block II HPFTP Post-shutdown Pressure Rise
- LPOTP 4107 Nozzle Vane Crack

## RSRM

- Unusual Pocketing of RSRM Nozzle Phenolic Material During Testing

***ADDITIONAL ASSESSED ITEMS ARE IN THE BACKUP CHARTS***



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# NSRS Summary

**There are no NASA Safety Reporting System reports open that are applicable to STS-108/UF1.**



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# Hazard Analysis Summary

**One new Accepted Risk hazard was baselined for STS-108/UF1.**

- **Hazard Report, MWIS-SGU-001, Fire and/or Explosion in the Aft Compartment Caused by the Micro – SGU**
- **Accepted Risk Hazard Causes**
  - **Battery Failure and/or Improper Battery Installation**
  - **Ignition Sources due to Electrical Circuitry**
- **Acceptance Rationale**
  - **Design and installation procedures have been established to preclude the possibility of ignition sources. All circuits have been conformal coated; the battery operates under a minimal load; and circuit protection exists to preclude undesired temperature increases.**

Likelihood	Probable			
	Infrequent			
	Remote			<u>X</u>
	Improbable			
		Marginal	Critical	Catastrophic
Severity				



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# FMEA/CIL Summary

The MPS FMEA/CIL Review Team recently assessed over 1150 MPS FMEAs and CILs. After review, the team upgraded the criticality of 61 CILs, downgraded the criticality of 193 CILs, and deleted 8.

- Two new criticality 1/1 CILs were identified associated with orifice erosion on GH2 and GO2 Flow Control Valves.
- Three criticality 1R/2 CILs were upgraded to 1/1
  - Rupture/Leakage of the GHE 3-Way Solenoid Valves, Regulator Leg
  - Failure of the GO2 Pressurization System Repress Isolation Check Valve (CV10)
  - Contact-to-Contact Short of the GH2 Flow Control Valve Close Switch (LV56, 57, 58)



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# Space Shuttle and Space Station Independent Assessments

Assessment Number	Title
IA1-1014	Investigate BMRRM status as an on orbit spare
IA-1016	Evaluation of the Flight qualification test environment for the BGA / BMRRM
IA-1018	On-Orbit Institutional Safety Practices
IA-1019	Evaluate Programs Review of the ISS KU/S-Band Antenna design and testing phases
IA1-1024	Determine Source and Evaluate Mitigation Plan for Debris Found Inside MPLMs Upon Ingress by 5A.1/6A Crews
IA1-1028	Procedure of new battery design. EVA perspective.
IA1-1034	Mini Payload Logistics Module (MPLM) Debris

*Additional Assessed Items Are In The Backup Charts*



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# **STS-108/UF1 Readiness Statement**

With the satisfactory completion of identified open work, Safety and Mission Assurance has no constraints to STS-108/UF1. S&MA has no issues that constrain any of the mission success criteria.

/s/ John Casper  
**SR&QA Director, JSC**

/s/ Shannon Bartell  
**Director, KSC Safety, Health  
and Independent Assessment**

/s/ Amanda Goodson  
**S&MA Director, MSFC**

/s/ Bill Higgins  
**Chief, Shuttle S&MA, KSC**

/s/ Jerry Holsomback  
**ISS S&MA Manager**

/s/ Hank Davis  
**HEDS IA Director**

/s/ Mark Erminger  
**SS SR&QA Manager**

/s/ Mike Smiles  
**S&MA Manager, SSC**



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# STS-108/UF1

## Flight Readiness Review

## Backup Package



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# Additional Assessments

### Orbiter

- MPLM Debris
- STS-105 Loss of AC2 Phase A during MPM Stow
- APU Tank Strut Anomaly
- Changes as a result of Block II Engine Pressure Anomaly
- SUPA Use on STS-108
- Wiring Separation Work
- Separation of Inverter AC Wiring
- ET Monoball Production Break
- MPS CIL Review
- Vent Door Actuator Binding

### GFE

- First Flight/Critical Process Change
  - Micro-Strain Gauge Unit (SGU)
  - 35 mm ET TPS Camera Assembly



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# Additional Assessments

## EVA

- Increased Capacity Battery (ICB) KOH Leak

## ET

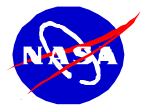
- First Flight/Critical Process Change
  - Redesigned GH2 Vent Quick Disconnect
- LH2 Burst Disc Failed Acceptance Test Procedure

## SRB

- First Flight/Critical Process Change
  - Range Safety Safe and Arm Device Delta Qualification

## SSME

- Oxidizer Preburner Harness Damage (STS-105-E2044)
- Broken Drill Bit in the Main Injector



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# Space Shuttle and Space Station Independent Assessments

Assessment Number	Title
IA1-1005	Evaluation of PRACA database to determine if it meets operational requirements.
IA1-1006	Evaluation of increasing number of Flight Rule Violations.
IA1-1013a	Requirements SR&QA reliance on rote compliance with requirements
IA1-1021	Evaluate proposal to include photos of items in the IMS
IA1-1022a&b	Evaluation of the SSC Configuration Management
IA1-1032	Assess the Adequacy of the HAZ MAT Process
IA2-1009	Down Payload Constraints
IAF-1008	Adequacy of FRAMs to Support Pre-positioning of Critical ORUs and Support Maintenance Tasks
JS-1027	Special Assessment: Review of the ISS Acoustic Requirements
JS-1010	Adequacy of the IVA Radiation Shielding Plans for the ISS
KS-1004	Assessment of ISS Element Processing at KSC
JS-1029	Evaluation of ISS Waiver and Exception Trends
JS-1017	Evaluation of Operational Procedures, Interfaces and Tools Related to the Threat of Orbital Debris to ISS
JS-1013	ISS Unintentional Transmitter and Receiver Electromagnetic Radiated Emissions vs Susceptibilities
JS-1020	Adequacy of the ISS Caution and Warning (C&W) Configuration to Support Crew Sleep
JA-1124	Assessment of the ISS Plasma Arcing/PCU Issues
MH-1003	ISS Response to Pressurized Element Depressurization Event
JS-9089	Determination of ISS Assembly Activity Failures That Would Require Shuttle Contingency Flights
JS-0013	ISS Crew Health and Performance Impacts Resulting from Long Term Exposure to Acoustic Environment
JS-9038	Adequacy of the End-to-End Verification Test of the Inventory Management System (IMS)
JS-9007	Review of Generic Flight Rules Volume B
JS-9008	Review of Generic Flight Rules Volume C
LSIS-167	Assess the Adequacy of External Viewing Resources to Support Station Activities for Stages 1 Through 16
MSFC-IA-015	International Space Station's Ability To Provide Adequate Caution & Warning Annunciation